The Urban Underground

China's subway evolution exemplifies the achievements of reform and opening up

By Yuan Yuan

More than 10 million people ride Beijing's 22 subway lines each day, making the metro system an indispensable part of the city's urban life.

But things were very different just 10 years ago, when Beijing only had eight subway lines. In the 1980s, the city's first two subway lines dominated underground transportation until the turn of the century, when more lines were finally added, and further expansion has occurred rapidly.

Fast growth

In recent years, subway networks have expanded considerably in China's megacities. At the same time, many other cities have hopped on the metro map. The lengthening city subway networks connect suburban districts with central areas, reduce commuter time and make people's lives more convenient. This is perhaps the epitome of China's urban development in the past 40 years, since reform and opening up began.

Line 1, running east and west, began operating in 1971 in Beijing, the first city in China to have an underground railway system.

Line 2, a loop circling roughly under the Second Ring Road, became the second operational line in 1984, but the area covered by both lines was mostly in downtown Beijing.

"In the 1990s, only a small fraction of people would choose the subway since it was more expensive than a ride by bus. Plus, the number of subway stations was quite limited," said Chang Zhifu, a volunteer with the metro system for many years. "Many who took the subway had to transfer to buses to get to their final destinations anyway, so it was not a good deal," the 76-year-old Beijing resident added. After quite a few price adjustments, in 2000 the fare was finally set at 3 yuan ($0.47), regardless of transfers or distance.

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The Yanfang subway line in southwestern Beijing, the first fully domestically developed automated line in China, opened to the public at the end of 2017.

The next line, Line 13, a half-loop that links the northern suburbs with Line 2, was put into operation in January 2003. Another line, Batong Line, an extension of Line 1, was opened in December 2003. These two lines helped Beijing's subway ridership hit 607 million in 2004.

Line 5, which took more than seven years to construct, was opened in October 2007 as the city's first north-south line. Subway fares were reduced to a flat fare of 2 yuan ($0.32), including unlimited transfers. That year, ridership rose to a total of 655 million.

In July 2008, Line 10, the Olympic Branch Line (Line 8) and the Airport Express were all opened on a trial basis ahead of the Beijing 2008 Summer Olympic Games. With the addition of the three new lines, total ridership rose by 77 percent over the previous year to 1.2 billion in 2008.

Since November 2008, Beijing's railway construction has accelerated. Above-ground light rail lines—which were cheaper to build—to suburban districts have sprouted up, and the city's subway network has rapidly expanded as more than 10 new lines have been added in the past 10 years.

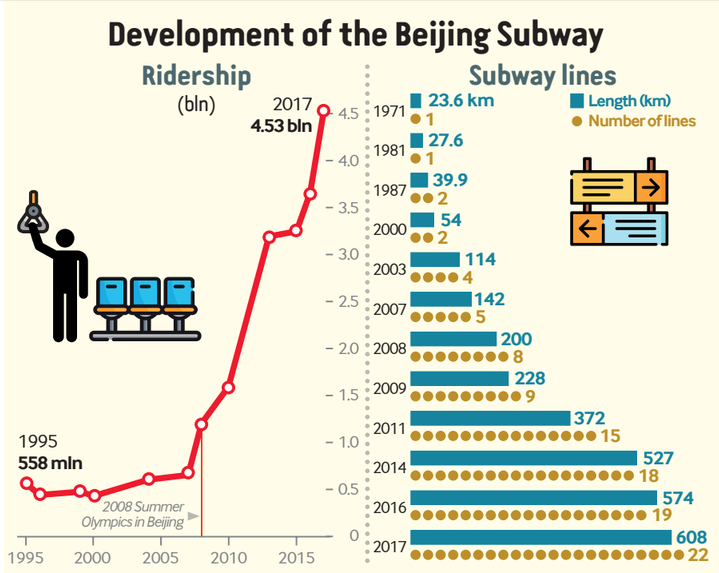
Improved services

With many more people opting for an underground commute, peak-hour congestion has become a major problem, as is the case in many other megacities around the world.

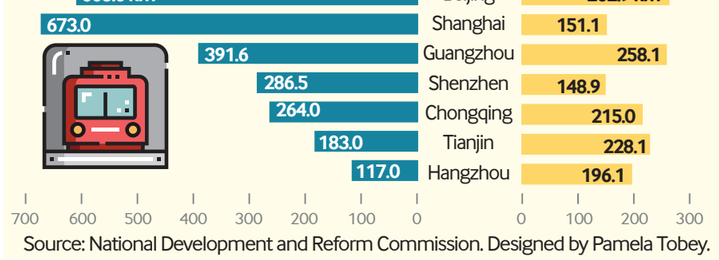
"We have to wait in super-long lines to squeeze onto the trains, and it is normal to wait for six trains before you are finally able to board one," said Fu Yimin, from Tiantongyuan, a residential compound at the northernmost stations of Line 5. "In order to be on time to work, I have to leave my house half an hour earlier to avoid rush hour."

This is commonplace for most of Beijing's subway lines at peak hours. In order to relieve the pressure, more lines and trains have been launched. In 2009, Line 4, funded through a joint venture with the Hong Kong MTR, was built as another north-south line, reaching the farthest southern suburbs. In December 2012, Line 6, paralleling Line 1's east-west route, was put into operation. At the end of 2017, the city's subway lines measured 608 km (expected to increase to 630 km by the end of this year), and ridership skyrocketed to 10.35 million daily, almost twice the number initially expected.

"The subway stations are now a lot cleaner and more orderly," said Chang, who now serves at the Nanluoguxiang Station of Line 8 for two hours a day. She said she is awed by the incredible expansion of the subway system in the past several years. "It is very convenient now to take the subway to go many places in the city—even Fragrant Hill in a far western suburb is within metro reach."



Source: Beijing Subway. Designed by Pamela Tobey.



Source: National Development and Reform Commission. Designed by Pamela Tobey.

Chang told *Beijing Review*, "There used to be a ticket-selling window here, but now all the tickets must be purchased through the machine"; every day, she helps passengers buy tickets using the automated ticket-selling machines. "More young people now choose to scan a QR code with their smartphones to hop on the subway, but most tourists and seniors still use cash," Chang said.

Technological advances have given metro expansion in many Chinese cities a strong boost, and since May 2013, cities only need approval from provincial authorities rather than national ministries to build a metro line.

"Urban rail transit not only helps with urban space expansion, but also boosts economic development," said Li Guoyong, an inspector with the National Development and Reform Commission's Department of Basic Industries.

Economic driver

At the end of 2017, the National Development Reform Commission announced plans to relax the requirements needed for local governments to pursue subway projects, including lowering the minimum population from 3 million to 1.5 million, which means more third- and fourth-tier cities can submit proposals.

"China's third-tier cities are actively building metros. This enthusiasm will be a key driver of infrastructure building," said Jiang Shenggang, a metro expert in Fujian Province on China's southeast coast.

By December 2017, there were 171 subway lines stretching over 5,083 km in 35 cities on the Chinese mainland. China has the longest urban railway network in the world, which is predicted to surpass 6,000 km by 2020.

The rapid development of China's urban railway system reflects the country's growing economic strength. The system has experienced the fastest growth over the past 15 years due to the investment of wealth, accumulated from the reform and opening up, in urban infrastructure construction. An urban railway system is expensive to build, with one kilometer of subway costing approximately 700 million yuan ($110 million). A city without economic strength cannot develop such an extensive system.

The progress in urban railway construction technologies has also contributed to the fast expansion of the infrastructure. Subway construction involves building underground tunnels, laying rails, manufacturing trains and the operation and management of subways. It is a systematic project that not only includes building traditional infrastructure, but also modern electronics and information technology.

The expansion of Chinese cities has made it necessary to develop urban railway systems. Since the start of the reform and opening up, a large number of people have migrated to cities and the number of private cars has increased dramatically, resulting in serious traffic congestion, and building subways has become an important way to solve this problem. The success of the urban railway network also reflects the openness and inclusiveness of cities. Since the beginning of the reform and opening up, the geographic mobility of people has greatly improved, promoting the prosperity of cities and making it necessary to build subways to improve urban transportation systems.

This year marks the 40th anniversary of the launch of China's reform and opening up, and the rapid development of China's urban railway system exemplifies the achievements made by the policy. As China furthers its opening up, it will continue to maintain steady and rapid economic growth, and railway systems will be available in more and more cities. ■

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